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Barren River Reservoir
Allen and Barren Counties, Kentucky

(U.S.) National Eutrophication Survey, Corvallis, OR

Prepared for

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NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

REPORT
ON
BARREN RIVER RESERVOIR
ALLEN AND BARREN COUNTIES
KENTUCKY
EPA REGION IV
WORKING PAPER No. 350

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON
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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT

ON

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WITH THE COOPERATION OF THE

KENTUCKY DEPARTMENT FOR NATURAL RESOURCES AND

ENVIRONMENTAL PROTECTION

AND THE

KENTUCKY NATIONAL GUARD

JUNE, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Kentucky Department for Natural Resources and Environmental Protection for professional involvement, to the Kentucky National Guard for conducting the tributary sampling phase of the Survey, and to those Kentucky wastewater treatment plant operators who voluntarily provided effluent samples.

Harold Snodgrass, former Director, and Mercer M. Peters of the Division of Water Quality provided invaluable lake documentation and counsel during the Survey; and the staff of the Division reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

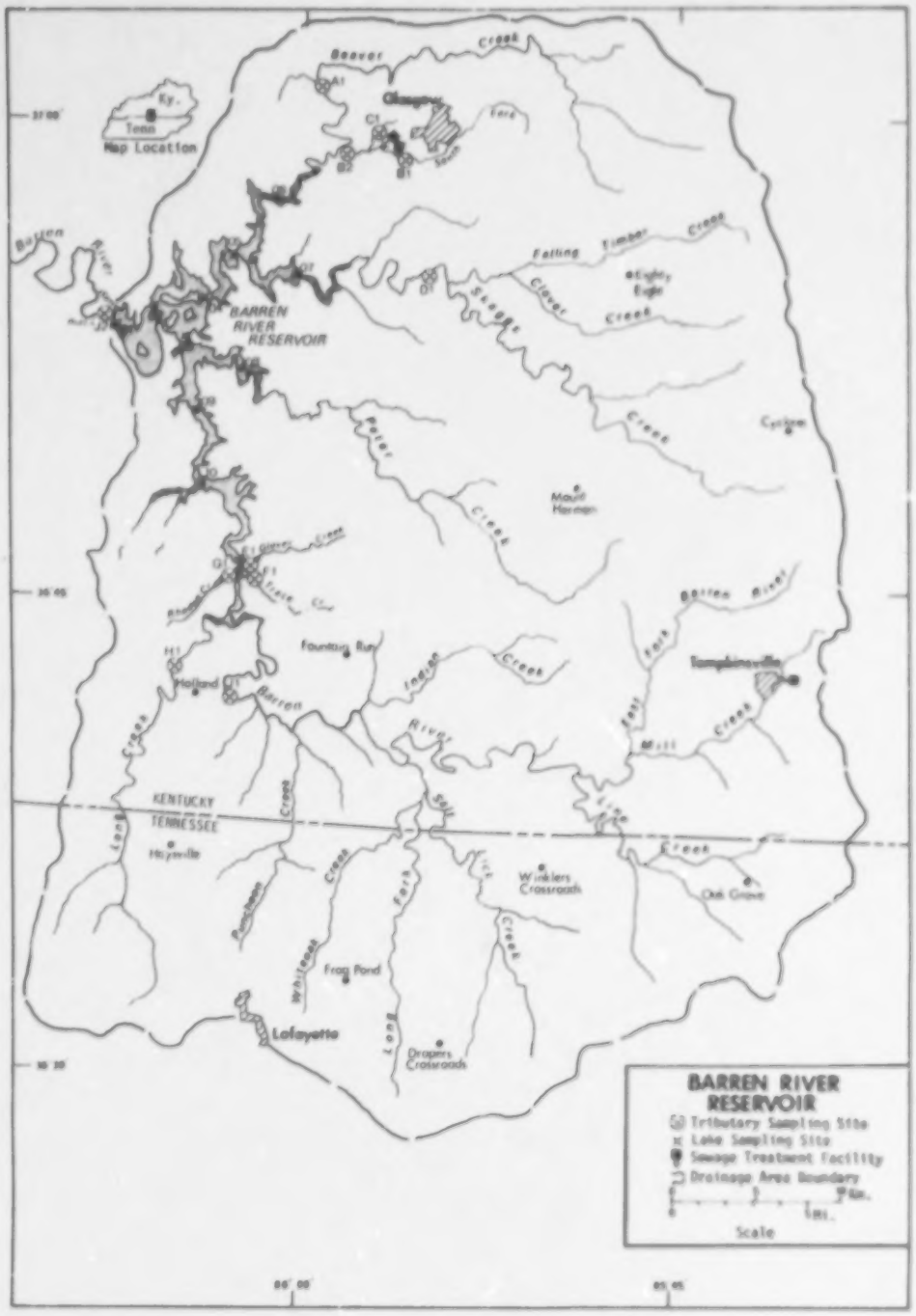
Major General Richard L. Frymire, the Adjutant General of Kentucky, and Project Officers Lt. Colonel Thomas Buyher, Jr., and Lt. Colonel David B. May, who directed the volunteer efforts of the Kentucky National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

STATE OF KENTUCKY

NAME	COUNTY
Barkley	Lyon, Trigg, KY; Cheatham, Montgomery, Stewart, TN
Barren River	Allen, Barren
Cumberland	Clinton, Pulaski, Russell, Wayne
Dale Hollow	Clinton, Cumberland, KY; Clay, Overton, Pickett, TN
Herrington	Boyler, Garrard, Mercer
Kentucky	Calloway, Livingston, Lyon, Marshall, Trigg, KY; Benton, Decatur, Henry, Houston, Humphreys, Perry, Stewart, TN


Beaver Creek
Ky.
Tenn
Map Location
Barren River
BARREN RIVER RESERVOIR
Falling Timber Creek
Clover Creek
Peter Creek
Mount Herman
Cypress
Fountain Run
Indian Creek
Barren River
Holland
Trammel Creek
KENTUCKY
TENNESSEE
Hazelville
Lafayette
Frog Pond
Whitleys Creek
Dripping Spring Creek
Long Creek
Drapers Crossroads
Winklers Crossroads
Oak Grove
Salt Lick Creek
Long Fork
Peters Creek
Trammel Creek
Rocky Fork
Gamaliel
Tompkinsville
Scale

BARREN RIVER RESERVOIR

STORET NO. 2105

1. CONCLUSIONS

A. Trophic Condition:

Survey data indicate Barren River Reservoir is eutrophic; i.e., well-supplied with nutrients and productive. Whether nutrient enrichment is beneficial or deleterious depends on the actual or potential effect on the uses of the water body. In this regard, personnel of the Kentucky Department for Natural Resources and Environmental Protection have indicated there is no known impairment of the designated beneficial uses of Barren River Reservoir.

This water body ranked third in overall trophic quality when the five Kentucky reservoirs sampled in 1973 were compared using a combination of six water quality parameters*. Two of the reservoirs had less median total phosphorus, median orthophosphorus, and median inorganic nitrogen; three had greater mean Secchi disc transparency; and two had less mean chlorophyll a. Marked depression or depletion of dissolved oxygen with depth occurred at seven of the 11 sampling stations in August, and depletion at depth occurred at station 2 in October.

Survey limnologists did not observe any nuisance conditions during sampling visits.

B. Rate-Limiting Nutrient:

The algal assay results indicate the reservoir was phosphorus

* See Appendix A.

limited at the time the samples were collected (05/18/73). The reservoir data indicate phosphorus limitation at all sampling times; i.e., all of the mean N/P mean ratios were 30/1 or greater, and phosphorus limitation would be expected. Possible exceptions to phosphorus limitation were stations 5, 6, and 7 in October when the mean N/P ratios were 13/1 (borderline nitrogen limitation).

C. Nutrient Controllability:

1. Point sources--During the sampling year, point-source phosphorus contributions amounted to at least 34.9% of the total input to the reservoir. However, the apparent phosphorus export rate of the South Fork at station B-2 was a very high 333 $kg/km^2/yr$ or nearly 24 times the rate at station B-1 about four kilometers upstream (see page 15 and map, page v). The magnitude of the increase between the two sampling sites is indicative of a significant intervening source of phosphorus other than the Glasgow wastewater treatment plant, and the Kentucky Department for Natural Resources and Environmental Protection is planning to conduct an intensive survey of that segment of the South Fork drainage in the spring of 1978 to determine the cause(s) of the excessive phosphorus export rate (Jett, 1977).

The phosphorus loading of 1.90 g/m^2 measured during the sampling year is nearly twice that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading. While even complete removal of phosphorus at the listed point sources would still

leave a loading somewhat in excess of a eutrophic loading, the reservoir is phosphorus limited, and it seems likely that a high degree of point-source phosphorus control would result in an improved trophic condition of the reservoir, particularly if a large part of the excessive phosphorus export of the South Fork proves to be controllable.

2. Non-point sources--The apparent phosphorus contribution of non-point sources amounted to 65.1% of the total reaching the reservoir. The gaged tributaries contributed a total of 54.7% and ranged from 21.6% (South Fork at B-2) to 0.2% (Trace Creek). The ungaged tributaries contributed an estimated 9.5% of the total phosphorus load.

Note that the South Fork at station B-2, with a drainage area of 50.0 km^2, contributed more phosphorus to the reservoir than the Barren River which has a drainage area of 995.1 km^2. The high export rate of the South Fork may have resulted from point source impact(s).

II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 40.47 kilometers^2.
2. Mean depth: 5.8 meters.
3. Maximum depth: > 18.6 meters.
4. Volume: 234.708 x 10^6 m^3.
5. Mean hydraulic retention time: 81 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Barren River	997.1	14.08
Beaver Creek	177.4	2.43
Huggins Branch**	(4.9)	(0.06)
South Fork (B-1)**	(33.2)	(0.44)
South Fork (B-2)	50.0	0.67
Skaggs Creek	365.2	5.07
Glover Creek	27.7	0.37
Trace Creek	13.3	0.18
Rhoden Creek	25.8	0.34
Long Creek	181.3	2.49
Minor tributaries & immediate drainage -	556.3	7.79
Totals	2,394.1	33.42

2. Outlet -

Barren River	2,434.6***	33.42***

† Table of metric conversions--Appendix B.
†† At seasonal (summer) pool level; Jett, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Areas and flows included in area and flow of South Fork at station B-2 (see map, page v).
*** Includes area of reservoir; outflow adjusted to equal sum of inflows.

C. Precipitation*:

1. Year of sampling: 153.9 centimeters.

2. Mean annual: 119.3 centimeters.

* See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Barren River Reservoir was sampled three times in 1973 by means of a pontoon-equipped Huey helicopter. Samples for physical and chemical paremeters were collected from one or more depths at eleven stations on the reservoir in May and August and from ten stations in October (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, three 18.9-liter depth-integrated samples were composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 18.6 meters at station 1, 16.8 meters at station 2, 17.4 meters at station 3, 14.3 meters at station 4, 10.7 meters at station 5, 6.1 meters at station 6, 7.0 meters at station 7, 8.5 meters at station 8, 13.7 meters at station 9, 12.2 meters at station 10, and 8.5 meters at station 11.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR BARREN RIVER RESERVOIR
STORET CODE 2105

PARAMETER	1ST SAMPLING (5/18/73) 11 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (8/11/73) 11 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (10/23/73) 10 SITES RANGE	MEAN	MEDIAN
TEMP (C)	14.8 - 20.5	18.2	18.6	16.8 - 30.1	26.7	28.1	21.4 - 29.8	25.0	22.0
DISS OXY (MG/L)	3.0 - 12.1	7.1	6.6	0.0 - 9.2	4.0	3.9	0.0 - 10.0	6.0	5.7
CNDCTVY (MCROMO)	****** -**********			174. - 295.	199.	188.	188. - 700.	218.	198.
PH (STAND UNITS)	7.5 - 8.8	8.0	7.9	7.3 - 9.0	8.2	8.2	7.2 - 8.3	7.6	7.4
TOT ALK (MG/L)	60. - 132.	84.	81.	65. - 125.	81.	79.	78. - 133.	88.	86.
TOT P (MG/L)	0.012 - 0.239	0.043	0.027	0.020 - 0.324	0.055	0.033	0.015 - 0.207	0.034	0.025
ORTHO P (MG/L)	0.002 - 0.122	0.010	0.003	0.005 - 0.135	0.013	0.008	0.004 - 0.013	0.007	0.006
NO2+NO3 (MG/L)	0.200 - 3.730	0.764	0.630	0.040 - 3.220	0.193	0.080	0.030 - 0.490	0.088	0.080
AMMONIA (MG/L)	0.020 - 0.370	0.076	0.060	0.050 - 2.200	0.234	0.110	0.040 - 0.560	0.120	0.100
KJEL N (MG/L)	0.200 - 0.800	0.441	0.400	0.200 - 2.400	0.645	0.600	0.200 - 0.800	0.384	0.300
INORG N (MG/L)	0.380 - 3.890	0.839	0.680	0.090 - 3.460	0.427	0.220	0.070 - 1.050	0.208	0.175
TOTAL N (MG/L)	0.700 - 4.330	1.205	1.025	0.240 - 3.820	0.838	0.660	0.240 - 1.090	0.472	0.410
CHLRPYL A (UG/L)	3.1 - 19.6	7.5	6.9	8.1 - 10.6	9.5	9.8	2.4 - 12.9	7.5	7.0
SECCHI (METERS)	0.6 - 2.1	1.4	1.4	0.6 - 1.8	1.2	1.3	0.4 - 1.5	1.0	0.9

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
05/18-19/73	1. Flagellates	4,402
	2. Stephanodiscus sp.	2,105
	3. Melosira sp.	2,074
	4. Nitzschia sp.	638
	5. Dinobryon sp.	383
	Other genera	861
	Total	10,463
08/11-13/73	1. Raphidiopsis sp.	9,775
	2. Lyngbya sp.	1,777
	3. Achnanthes sp.	1,333
	4. Flagellates	889
	5. Cyclotella sp.	207
	Other genera	563
	Total	14,544
10/23/73	1. Melosira sp.	1,149
	2. Flagellates	938
	3. Cyclotella sp.	181
	4. Dactylococcopsis sp.	181
	5. Raphidiopsis sp.	151
	Other genera	772
	Total	3,372

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
05/18-19/73	1	3.1
	2	3.7
	3	4.3
	4	5.6
	5	10.9
	6	19.6
	7	8.4
	8	6.9
	9	7.0
	10	3.1
	11	10.4

Sampling Date	Station Number	Chlorophyll a (µg/l)
08/11-13/73	1	9.2
	2	9.8
	3	10.1
	4	10.4
	5	10.6
	6	8.9
	7	10.6
	8	9.8
	9	8.5
	10	8.4
	11	8.1
10/23/73	1	2.4
	2	3.4
	3	5.9
	4	5.7
	5	10.9
	6	-
	7	-
	8	8.5
	9	7.0
	10	10.6
	11	12.9

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. Stations 1, 2, 3, and 4 -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.012	0.716	0.1
0.050 P	0.062	0.716	18.2
0.050 P + 1.0 N	0.062	1.716	19.2
1.0 N	0.012	1.716	0.1

b. Stations 5, 6, and 7 -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.040	1.104	15.8
0.050 P	0.090	1.104	25.0
0.050 P + 1.0 N	0.090	2.104	26.8
1.0 N	0.040	2.104	15.0

c. Stations 8, 9, 10, and 11 -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.008	0.672	0.1
0.050 P	0.058	0.672	14.8
0.050 P + 1.0 N	0.058	1.672	19.5
1.0 N	0.008	1.672	0.1

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential primary productivity at stations 1, 2, 3, and 4, and stations 8, 9, 10, and 11, was low at the time the samples were collected (May, 1973). However, the control yield of the sample from stations 5, 6, and 7 indicates a high potential primary productivity; this most likely is an indication of the proximity of upstream nutrient sources. The results also indicate the reservoir was phosphorus limited at that time. Note the increases in yields with the addition of phosphorus and the lack of significant change in yields with the addition of nitrogen alone.

The reservoir data indicate phosphorus limitation at all sampling times, with the possible exception of stations 5, 6, and 7 in October, 1973, when the mean inorganic nitrogen/orthophosphorus ratios were 13/1 at those stations (borderline nitrogen limitation).

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Kentucky National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the months of January and February when extra samples were collected at most of the sites. Sampling was begun in March, 1973, and was completed in March, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Kentucky District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient exports, in $kg/km^2/year$, at stations A-1, B-1, C-1, D-1, E-1, F-1, G-1, and H-1 and multiplying the means by the ZZ area in km^2.

The operators of the Glasgow and Tompkinsville wastewater treatment plants provided monthly effluent samples and corresponding flow data.

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* See Working Paper No. 175.

A. Waste Sources:

1. Known municipal* -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Tompkinsville	2,207	act. sludge	761.6	Curtis Br. of Mill Cr.
Glasgow**	10,000	tr. filter	10,912.2	S. Fk., Beaver Cr.

2. Known industrial - None with separate discharges.

* Treatment plant questionnaires.
** Approximately 50% of the waste load contributed by industries.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Barren River	15,245	19.8
Beaver Creek	3,360	4.4
South Fork (B-2)	16,655	21.6
Skaggs Creek	4,060	5.3
Glover Creek	405	0.5
Trace Creek	170	0.2
Rhoden Creek	330	0.4
Long Creek	1,915	2.5
b. Minor tributaries & immediate drainage (non-point load) -	7,300	9.5
c. Known municipal STP's -		
Tompkinsville	2,945	3.8
Glasgow	23,975	31.1
d. Septic tanks* -	20	<0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	710	0.9
Total	77,090	100.0

2. Outputs -

Reservoir outlet - Barren River 50,720

3. Net annual P accumulation - 26,370 kg.

* Estimate based on 65 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Barren River	661,915	37.6
Beaver Creek	158,530	9.0
South Fork (B-2)	59,610	3.4
Skaggs Creek	267,665	15.2
Glover Creek	11,915	0.7
Trace Creek	6,660	0.4
Rhoden Creek	11,800	0.7
Long Creek	115,635	6.6
b. Minor tributaries & immediate drainage (non-point load) -	354,295	20.1
c. Known municipal STP's -		
Tompkinsville	1,655	< 0.1
Glasgow	65,640	3.7
d. Septic tanks* -	695	< 0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	43,690	2.5
Total	1,759,705	100.0

2. Outputs -

Reservoir outlet - Barren River 1,472,500

3. Net annual N accumulation - 287,205 kg.

* Estimate based on 65 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Beaver Creek	19	894
South Fork (B-1)	14	786
South Fork (B-2)*	333	1,192
Huggins Branch	9	656
Skaggs Creek	11	733
Glover Creek	15	430
Trace Creek	13	501
Rhoden Creek	13	457
Long Creek	11	638
Barren River	15	664

* This excessively high export may be due to point sources.

E. Yearly Loadings:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	1.90	0.65	43.5	7.1

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Barren River Reservoir:

"Dangerous" (eutrophic loading)	0.98
"Permissible" (oligotrophic loading)	0.49

V. LITERATURE REVIEWED

Jett, Shelby, 1974. Personal communication (reservoir morphometry). Dept. for Nat. Resources & Env. Prot., Frankfort.

_____, 1977. Personal communication (planned segment survey of the South Fork). Dept. for Nat. Resources & Env. Prot., Frankfort.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P
2101	LAKE CUMBERLAND-	0.016	0.330	432.381	3.805	14.900	0.007
2102	DALE HOLLOW RESERVOIR	0.010	0.270	330.000	3.594	14.800	0.005
2103	HERRINGTON LAKE	0.079	0.550	442.667	14.908	14.900	0.047
2104	KENTUCKY LAKE	0.072	0.520	461.972	9.089	12.600	0.030
2105	BARREN RIVER RESERVOIR	0.027	0.460	452.594	8.216	14.900	0.006

RCENT OF LAKES WITH HIGHER VALUES

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P	INDEX NO
2101	LAKE CUMBERLAND	60 (3)	60 (3)	60 (3)	60 (3)	20 (0)	40 (2)	300
2102	DALE HOLLOW RESERVOIR	80 (4)	80 (4)	80 (4)	80 (4)	60 (3)	80 (4)	460
2103	HERRINGTON LAKE	0 (0)	0 (0)	40 (2)	0 (0)	20 (0)	0 (0)	60
2104	KENTUCKY LAKE	20 (1)	20 (1)	0 (0)	20 (1)	80 (4)	20 (1)	160
2105	BARREN RIVER RESERVOIR	40 (2)	40 (2)	20 (1)	40 (2)	20 (0)	60 (3)	220

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	2102	DALE HOLLOW RESERVOIR	460
2	2101	LAKE CUMBERLAND	300
3	2105	BARREN RIVER RESERVOIR	220
4	2104	KENTUCKY LAKE	160
5	2103	HERRINGTON LAKE	60

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2105 BARREN RIVER LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 2434.6

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2105A1	177.4	3.99	5.32	6.43	3.74	2.46	1.22	1.08	0.57	0.37	0.27	1.22	2.69	2.43
2105B1	33.2	0.68	0.99	1.19	0.68	0.45	0.21	0.19	0.09	0.07	0.05	0.22	0.48	0.44
2105B2	50.0	1.05	1.47	1.81	1.02	0.71	0.34	0.28	0.14	0.10	0.07	0.34	0.74	0.67
2105C1	4.9	0.09	0.14	0.18	0.10	0.07	0.03	0.03	0.01	0.01	0.01	0.03	0.07	0.06
2105D1	365.2	8.55	11.04	13.22	7.82	5.01	2.63	2.24	1.22	0.82	0.57	2.52	5.58	5.07
2105E1	27.7	0.57	0.82	0.99	0.57	0.40	0.18	0.16	0.07	0.05	0.04	0.19	0.42	0.37
2105F1	13.3	0.26	0.40	0.48	0.27	0.19	0.08	0.08	0.03	0.03	0.02	0.09	0.20	0.18
2105G1	25.8	0.54	0.76	0.93	0.51	0.37	0.16	0.15	0.07	0.05	0.04	0.17	0.40	0.34
2105H1	181.3	4.11	5.44	6.57	3.82	2.52	1.25	1.10	0.57	0.40	0.27	1.25	2.75	2.49
2105J1	997.1	24.52	30.44	36.08	21.75	13.56	7.53	6.20	3.62	2.35	1.64	6.91	15.38	14.08
2105J2	2434.6	68.36	87.37	42.16	31.26	31.38	20.84	27.04	21.58	16.88	37.07	62.61	50.97	39.64
2105Z2	556.8	13.31	16.91	20.16	11.98	7.62	4.11	3.43	1.93	1.27	0.88	3.85	8.55	7.79

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 2434.6
SUM OF SUB-DRAINAGE AREAS = 2432.7
TOTAL FLOW IN = 409.42
TOTAL FLOW OUT = 477.51

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2105A1	3	73	12.54						
	4	73	8.44	13	3.71				
	5	73	4.73	1	6.06				
	6	73	2.04	17	1.22				
	7	73	1.47	22	0.65				
	8	73	0.76	19	0.57				
	9	73	0.24	16	0.23				
	10	73	0.42	14	0.51				
	11	73	0.91	17	0.48				
	12	73	4.42						
	1	74	14.92	20	4.87	30	7.14		
	2	74	5.44	13	3.03	28	4.62		
	3	74	5.75	29	3.54				
2105B1	3	73	2.32						
	4	73	1.53	13	0.68				
	5	73	0.88	1	1.13				
	6	73	0.37	17	0.22				
	7	73	0.26	22	0.12				
	8	73	0.12	19	0.09				
	9	73	0.04	16	0.04				
	10	73	0.07	14	0.08				
	11	73	1.27	17	0.09				
	12	73	0.79						
	1	74	2.55	13	2.46	29	0.82	30	1.22
	2	74	1.02	26	0.85				
	3	74	1.08	29	0.65				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2105 BARREN RIVER LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2105B2	3	73	3.54						
	4	73	2.29	13	1.02				
	5	73	1.36	1	1.73				
	6	73	0.57	17	0.34				
	7	73	0.40	22	0.18				
	8	73	0.19	19	0.14				
	9	73	0.07	16	0.07				
	10	73	0.11	14	0.13				
	11	73	1.93	17	0.13				
	12	73	1.22						
	1	74	3.91	20	1.27	30	1.87		
	2	74	1.50	13	0.85	28	1.27		
	3	74	1.61	29	0.99				
2105C1	3	73	0.34						
	4	73	0.22	13	0.10				
	5	73	0.14	1	0.17				
	6	73	0.05	17	0.03				
	7	73	0.04	22	0.02				
	8	73	0.01	19	0.01				
	9	73	0.01	16	0.01				
	10	73	0.01	14	0.01				
	11	73	0.18	17	0.01				
	12	73	0.12						
	1	74	0.34	20	0.11	30	0.16		
	2	74	0.14	13	0.08	28	0.12		
	3	74	0.16	29	0.10				
2105D1	3	73	25.80						
	4	73	17.67	13	7.79				
	5	73	9.63	1	12.32				
	6	73	4.39	17	2.63				
	7	73	3.06	22	1.36				
	8	73	1.67	19	1.25				
	9	73	0.54	16	0.54				
	10	73	0.88	14	1.08				
	11	73	14.27	17	0.99				
	12	73	9.15						
	1	74	31.97	20	10.42	30	15.32		
	2	74	11.27	13	6.29	28	9.54		
	3	74	11.81	29	7.25				
2105E1	3	73	1.93	31	0.76				
	4	73	1.27	28	1.19				
	5	73	0.76						
	6	73	0.28	11	0.18				
	7	73	0.22	22	0.10				
	8	73	0.10	19	0.08				
	9	73	0.03	16	0.03				
	10	73	0.06	15	0.06				
	11	73	1.05	28	11.81				
	12	73	0.71	27	2.12				
	1	74	2.12	26	0.68				
	2	74	0.85	23	1.50				
	3	74	0.88	31	0.51				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2105 BARREN RIVER LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2105F1	3	73	0.93	31	0.37				
	4	73	0.59	28	0.57				
	5	73	0.37						
	6	73	0.14	11	0.09				
	7	73	0.10	22	0.05				
	8	73	0.05	19	0.03				
	9	73	0.02	16	0.02				
	10	73	0.03	15	0.03				
	11	73	0.51	28	5.75				
	12	73	0.31	27	0.93				
	1	74	0.99	26	0.31				
	2	74	0.40	23	0.71				
	3	74	0.42	31	0.25				
2105G1	3	73	1.81	31	0.74				
	4	73	1.16	28	1.08				
	5	73	0.71						
	6	73	0.27						
	7	73	0.21	22	0.09				
	8	73	0.09	19	0.07				
	9	73	0.03	16	0.03				
	10	73	0.06	15	0.06				
	11	73	0.99	28	11.19				
	12	73	0.65	27	1.95				
	1	74	2.01	26	0.65				
	2	74	0.79	23	1.42				
	3	74	0.82	31	0.48				
2105H1	3	73	12.80	31	5.13				
	4	73	8.64	28	8.04				
	5	73	4.84						
	6	73	2.07						
	7	73	1.50	22	0.65				
	8	73	0.76	19	0.57				
	9	73	0.26	16	0.25				
	10	73	0.42	15	0.45				
	11	73	7.05	28	79.57				
	12	73	4.50	27	13.51				
	1	74	15.35	26	4.98				
	2	74	5.55	23	9.83				
	3	74	5.86	31	3.45				
2105J1	3	73	70.23	31	28.15				
	4	73	49.27	28	45.87				
	5	73	260.51						
	6	73	12.57						
	7	73	8.50	22	3.74				
	8	73	4.96	19	3.71				
	9	73	1.53	16	1.50				
	10	73	2.52	15	2.78				
	11	73	39.08	28	441.74				
	12	73	25.23	27	75.61				
	1	74	91.75						
	2	74	31.15	23	54.93				
	3	74	32.28	31	19.06				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2105 BARREN RIVER LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2105J2	3	73	17.19						
	4	73	60.63	13	101.66				
	5	73	97.32	1	12.52				
	6	73	56.46	17	53.80				
	7	73	39.33	22	20.64				
	8	73	9.49	19	13.45				
	9	73	10.68	16	3.82				
	10	73	32.22	15	30.02				
	11	73	54.20	28	22.57				
	12	73	89.20						
	1	74	90.50	20	103.92	30	134.79		
	2	74	129.95	13	131.11	28	121.20		
	3	74	51.90	29	4.90				
2105Z2	3	73	39.36						
	4	73	27.07						
	5	73	14.61						
	6	73	6.85						
	7	73	4.70						
	8	73	2.63						
	9	73	0.82						
	10	73	1.36						
	11	73	21.83						
	12	73	14.05						
	1	74	49.84						
	2	74	17.24						
	3	74	18.01						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/01/27

210501
36 53 28.0 086 07 17.0
BARREN RIVER RESERVOIR
21089 KENTUCKY

11EPALES
3

2111202
0060 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/09/18	09 55	0000	18.8		84	190	7.50	78	0.040	0.500	0.620	0.005
	09 55	0004	18.8	9.5		180	8.00	70	0.020	0.400	0.620	0.004
	09 55	0024	18.5	9.4		180	8.00	69	0.030	0.300	0.620	0.003
	09 55	0040	17.2	7.8		185	7.90	74	0.040	0.300	0.670	0.004
	09 55	0056	14.8	5.3		208	7.70	84	0.030	0.300	0.850	0.006
73/09/11	16 20	0000	29.4		72	176	8.30	66	0.100	0.800	0.100	0.010
	16 20	0005	29.4	8.4		177	8.20	66	0.080	0.300	0.090	0.012
	16 20	0015	28.5	3.0		175	8.20	68	0.180	0.500	0.060	0.009
	16 20	0025	25.2	0.1		210	8.00	85	0.240	0.600	0.040	0.008
	16 20	0035	23.2	0.0		192	7.90	85	0.240	0.400	0.050	0.009
	16 20	0045	20.9	0.0		182	7.60	83	0.390	0.700	0.110	0.009
	16 20	0061	16.8	0.2		192	7.60	95	0.060	1.200	0.080	0.006
73/10/23	10 20	0000	22.0		00	195	7.30	79	0.180	0.800	0.110	0.008
	10 20	0005	22.0	5.4		195	7.30	78	0.170	0.300	0.110	0.006
	10 20	0015	22.0	4.4		195	7.30	80	0.170	0.300	0.100	0.006
	10 20	0035	21.9	4.0		195	7.30	81	0.180	0.300	0.110	0.012
	10 20	0045	21.8	4.2		196	7.30	82	0.220	0.400	0.100	0.009

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/09/18	09 55	0000	0.017	3.1
	09 55	0004	0.015	
	09 55	0024	0.020	
	09 55	0040	0.012	
	09 55	0056	0.028	
73/09/11	16 20	0000	0.022	9.2
	16 20	0005	0.022	
	16 20	0015	0.033	
	16 20	0025	0.024	
	16 20	0035	0.026	
	16 20	0045	0.026	
	16 20	0061	0.067	
73/10/23	10 20	0000	0.010	2.4
	10 20	0005	0.016	
	10 20	0015	0.010	
	10 20	0035	0.025	
	10 20	0045	0.025	

STORET RETRIEVAL DATE 75/01/27

210502
36 54 02.0 086 05 47.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0060 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	10 35	0000	19.1		84	186	8.00	71	0.040	0.480	0.610	0.003
	10 35	0004	19.1	9.9		182	8.20	72	0.020	0.480	0.600	0.006
	10 35	0024	18.8	9.1		192	8.00	72	0.040	0.480	0.590	0.004
	10 35	0030	18.0	7.0		198	7.90	78	0.060	0.500	0.670	0.006
	10 35	0035	17.7	5.6		219	7.70	89	0.120	0.600	0.790	0.005
	10 35	0040	17.3	5.8		200	7.70	85	0.120	0.200	0.730	0.004
	10 35	0045	16.6	5.4		200	7.60	84	0.120	0.200	0.710	0.002
	10 35	0055	15.5	4.0		219	7.60	87	0.100	0.200	0.750	0.002
73/08/11	16 25	0000	29.5		84	179	8.20	68	0.040	0.600	0.060	0.005
	16 25	0005	29.4	8.6		178	8.30	67	0.080	0.400	0.100	0.009
	16 25	0015	28.7	7.0		176	7.90	69	0.120	0.400	0.120	0.007
	16 25	0025	25.2	0.5		205	8.10	92	0.440	0.880	0.050	0.006
	16 25	0038	22.7	1.0		203	8.10	93	0.310	0.800	0.050	0.009
73/10/23	10 45	0000	21.9		48	194	7.40	85	0.150	0.300	0.090	0.004
	10 45	0005	21.8	5.9		194	7.40	87	0.140	0.300	0.090	0.005
	10 45	0015	21.7	5.6		195	7.40	90	0.150	0.200	0.090	0.006
	10 45	0036	21.5	8.0		196	7.40	90	0.150	0.300	0.080	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	10 35	0000	0.046	3.7
	10 35	0004	0.017	
	10 35	0024	0.016	
	10 35	0030	0.023	
	10 35	0035	0.032	
	10 35	0040	0.025	
	10 35	0045	0.029	
	10 35	0055	0.026	
73/08/11	16 25	0000	0.020	9.8
	16 25	0005	0.026	
	16 25	0015	0.024	
	16 25	0025	0.033	
	16 25	0038	0.034	
73/10/23	10 45	0000	0.016	3.4
	10 45	0005	0.017	
	10 45	0015	0.015	
	10 45	0036	0.025	

STORET RETRIEVAL DATE 75/01/27

210503
36 53 01.0 086 04 36.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0061 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/18	13	25 0000	19.7		72	180	8.00	73	0.040	0.300	0.510	0.007
	13	25 0004	19.7	10.0		176	8.20	71	0.030	0.200	0.500	0.002
	13	25 0024	18.5	8.2		176	8.10	70	0.040	0.200	0.530	0.002
	13	25 0040	16.6	5.1		183	7.90	73	0.080	0.200	0.640	0.002
	13	25 0057	15.3	3.1		198	7.70	80	0.090	0.300	0.700	0.013
73/08/13	09	40 0000	28.6		52	181	9.00	71	0.090	1.400	0.060	0.006
	09	40 0005	28.4	7.8		182	8.80	71	0.050	0.700	0.040	0.008
	09	40 0015	28.3	7.2		184	8.40	68	0.060	0.700	0.060	0.007
	09	40 0025	24.9	0.6		192	8.00	79	0.200	0.800	0.100	0.007
	09	40 0033	23.0	0.8		200	7.90	86	0.500	1.400	0.090	0.005
73/10/23	11	05 0000	21.4		45	195	7.60	89	0.100	0.300	0.080	0.004
	11	05 0005		7.6		193	7.50	87	0.080	0.200K	0.080	0.005
	11	05 0015		5.6		194	7.50	88	0.100	0.200K	0.070	0.005
	11	05 0036		4.6		209	7.30	87	0.040	0.600	0.080	0.005

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/18	13	25 0000	0.026	4.3
	13	25 0004	0.020	
	13	25 0024	0.021	
	13	25 0040	0.026	
	13	25 0057	0.035	
73/08/13	09	40 0000	0.024	10.1
	09	40 0005	0.024	
	09	40 0015	0.025	
	09	40 0025	0.026	
	09	40 0033	0.060	
73/10/23	11	05 0000	0.026	5.9
	11	05 0005	0.023	
	11	05 0015	0.022	
	11	05 0036	0.207	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210504
36 54 10.0 086 03 58.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0051 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/18	14	05 0000	19.4		70	211	8.10	85	0.080	0.300	0.680	0.007
	14	05 0004	19.5	10.3		210	8.30	86	0.020	0.300	0.650	0.006
	14	05 0017	19.0	9.1		202	8.30	78	0.040	0.300	0.640	0.003
	14	05 0020	19.0	8.8		220	8.00	77	0.040	0.300	0.650	0.003
	14	05 0025	18.1	5.1		221	7.80	84	0.150	0.400	0.820	0.003
	14	05 0035	17.4	3.5		219	7.70	81	0.230	0.600	0.880	0.010
	14	05 0047	16.7	3.0		238	7.60	92	0.370	0.800	0.700	0.012
73/08/13	10	05 0000	28.9		54	180	8.50	68	0.070	1.200	0.050	0.011
	10	05 0005	28.8	7.6		180	8.60	69	0.070	1.200	0.100	0.010
	10	05 0015	28.7	6.7		182	7.80	66	0.070	1.000	0.050	0.007
	10	05 0025	25.4	0.2		240	7.40	97	0.290	0.500	0.150	0.006
	10	05 0035	23.5	0.2		262	7.30	113	0.860	1.000	0.060	0.005
	10	05 0046	20.7	0.2		255	8.20	125	2.200	2.400	0.120	0.010
73/10/23	11	55 0000			36	204	7.40	96	0.150	0.500	0.080	0.004
	11	55 0005		5.8		203	7.40	83	0.140	0.500	0.070	0.007
	11	55 0015		5.4		203	7.40	82	0.150	0.400	0.070	0.007
	11	55 0033		4.6		212	7.30	84	0.180	0.500	0.060	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/18	14	05 0000	0.023	5.6
	14	05 0004	0.027	
	14	05 0017	0.017	
	14	05 0020	0.017	
	14	05 0025	0.038	
	14	05 0035	0.057	
	14	05 0047	0.065	
73/08/13	10	05 0000	0.022	10.4
	10	05 0005	0.026	
	10	05 0015	0.024	
	10	05 0025	0.048	
	10	05 0035	0.089	
	10	05 0046	0.133	
73/10/23	11	55 0000	0.025	5.7
	11	55 0005	0.025	
	11	55 0015	0.025	
	11	55 0033	0.034	

STORET RETRIEVAL DATE 75/01/27

210505
36 55 25.0 086 02 49.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0034 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/18	15 00	0000	19.6		36	238	8.20	93	0.060	0.600	0.650	0.005
	15 00	0004	19.6	12.1		238	8.50	92	0.060	0.400	0.650	0.007
	15 00	0011	19.1	7.9		239	8.20	96	0.070	0.400	0.670	0.003
	15 00	0022	18.5	6.0		238	8.00	95	0.120	0.400	0.820	0.003
	15 00	0030	17.1	5.9		250	7.80	104	0.180	0.500	0.200	0.007
73/08/13	10 30	0000	28.9		52	181	8.50	66	0.080	0.600	0.060	0.005
	10 30	0005	28.8	7.6		181	8.50	67	0.050	0.200	0.040	0.009
	10 30	0015	28.3	4.8		202	8.10	67	0.090	0.300	0.090	0.011
	10 30	0025	25.1	0.2		253	7.60	97	0.380	0.600	0.530	0.035
	10 30	0035	24.2	1.0		236	7.60	89	0.290	0.700	0.610	0.023
73/10/23	12 10	0000			33	206	7.90	83	0.080	0.600	0.060	0.006
	12 10	0005		8.2		205	7.90	82	0.070	0.400	0.060	0.013
	12 10	0017		7.0		223	7.80	88	0.080	0.600	0.040	0.012

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/18	15 00	0000	0.027	10.9
	15 00	0004	0.027	
	15 00	0011	0.039	
	15 00	0022	0.042	
	15 00	0030	0.053	
73/08/13	10 30	0000	0.036	10.6
	10 30	0005	0.039	
	10 30	0015	0.046	
	10 30	0025	0.165	
	10 30	0035	0.147	
73/10/23	12 10	0000	0.038	10.9
	12 10	0005	0.030	
	12 10	0017	0.055	

STORET RETRIEVAL DATE 75/01/27

210506
36 57 15.0 086 00 54.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0022 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	09 40	0000	19.8		24	250	8.80	95	0.040	0.800	0.660	0.006
	09 40	0004	19.4	10.8		340	8.00	98	0.050	0.600	0.750	0.021
	09 40	0010	15.3	7.0		340	7.80	130	0.140	0.600	3.300	0.090
	09 40	0015	15.0	6.4		340	7.80	131	0.160	0.600	3.730	0.122
	09 40	0020	14.9	6.4		340	7.80	132	0.160	0.800	3.220	0.119
73/08/13	10 55	0000	29.4		24	190	8.70	65	0.070	0.700	0.070	0.008
	10 55	0005	27.8	7.0		241	8.40	81	0.120	0.700	0.440	0.075
	10 55	0013	23.7	5.4		295	8.50	110	0.240	0.600	3.220	0.135

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	09 40	0000	0.068	19.6
	09 40	0004	0.198	
	09 40	0010	0.200	
	09 40	0015	0.223	
	09 40	0020	0.239	
73/08/13	10 55	0000	0.086	8.9
	10 55	0005	0.189	
	10 55	0013	0.324	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210507
36 54 55.0 085 59 57.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0022 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	10 25	0000	20.5		40	240	8.60	93	0.050	0.600	0.530	0.011
	10 25	0004	20.3	10.6		240	8.20	93	0.060	0.600	0.530	0.006
	10 25	0010	19.6	8.6		200	8.60	94	0.040	0.500	0.530	0.005
	10 25	0015	17.3	6.8		240	8.30	95	0.060	0.600	0.500	0.002K
	10 25	0023	16.2	6.8		280	7.90	110	0.040	0.400	0.790	0.003
73/08/13	11 15	0000	29.1		29	185	8.60	66	0.060	0.400	0.060	0.008
	11 15	0005	29.0	7.8		185	8.60	68	0.060	0.200	0.050	0.011
	11 15	0015	24.7	4.8		236	7.90	94	0.120	0.400	0.600	0.020
73/10/23	12 40	0000		9.3	24		8.30	91	0.040	0.500	0.030	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	10 25	0000	0.045	8.4
	10 25	0004	0.048	
	10 25	0010	0.037	
	10 25	0015	0.028	
	10 25	0023	0.039	
73/08/13	11 15	0000	0.043	10.6
	11 15	0005	0.046	
	11 15	0015	0.112	
73/10/23	12 40	0000	0.036	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210508
36 51 50.0 086 02 37.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0032 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	11 00	0000	19.9		48	190	8.20	78	0.030	0.500	0.540	0.004
	11 00	0004	19.8	9.0		190	8.20	78	0.030	0.400	0.520	0.002
	11 00	0015	18.7	6.6		220	7.80	96	0.060	0.300	0.830	0.002K
	11 00	0028	16.2	6.6		220	7.70	97	0.080	0.500	0.850	0.002
73/08/13	13 35	0000	29.4		60	174	8.60	72	0.070	0.400	0.060	0.007
	13 35	0005	29.1	9.2		174	8.70	72	0.050	0.200	0.050	0.009
	13 35	0015	27.6	8.0		184	8.00	79	0.120	0.300	0.100	0.008
73/10/23	12 45	0000	29.8		37	190	8.20	85	0.040	0.500	0.050	0.006
	12 45	0005	29.8	9.0		188	8.10	86	0.040	0.300	0.050	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	11 00	0000	0.025	6.9
	11 00	0004	0.022	
	11 00	0015	0.029	
	11 00	0028	0.036	
73/08/13	13 35	0000	0.027	9.8
	13 35	0005	0.027	
	13 35	0015	0.050	
73/10/23	12 45	0000	0.031	8.5
	12 45	0005	0.030	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210509
36 50 40.0 086 04 20.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
00-9 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO. MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	13	20 0000	19.9		54	170	8.20	62	0.040	0.600	0.410	0.003
	13	20 0004	19.8	9.8		165	8.30	60	0.030	0.500	0.400	0.002
	13	20 0015	18.2	7.0		175	7.90	62	0.050	0.400	0.490	0.002K
	13	20 0030	17.3	4.8		160	7.60	72	0.080	0.400	0.540	0.002K
	13	20 0045	16.7	3.8		165	7.60	74	0.080	0.400	0.560	0.002K
73/08/13	13	55 0000	29.2		50	186	8.60	75	0.070	0.500	0.050	0.013
	13	55 0005	28.1	7.8		181	8.50	72	0.050	0.300	0.050	0.008
	13	55 0015	27.3	2.2		189	7.90	81	0.060	0.200	0.070	0.006
	13	55 0025	24.8	0.2		189	7.60	81	0.180	0.300	0.320	0.006
	13	55 0040	22.7	1.2		219	7.40	98	0.700	1.000	0.160	0.006
73/10/23	12	55 0000			46	203	7.80	86	0.060	0.300	0.080	0.004
	12	55 0005		8.0		197	7.70	85	0.060	0.500	0.080	0.006
	12	55 0015		6.8		198	7.60	84	0.070	0.200	0.080	0.006
	12	55 0033		4.8		255	7.40	94	0.110	0.400	0.100	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	13	20 0000	0.033	7.0
	13	20 0004	0.027	
	13	20 0015	0.020	
	13	20 0030	0.021	
	13	20 0045	0.021	
73/08/13	13	55 0000	0.024	8.5
	13	55 0005	0.025	
	13	55 0015	0.025	
	13	55 0025	0.031	
	13	55 0040	0.094	
73/10/23	12	55 0000	0.022	7.0
	12	55 0005	0.026	
	12	55 0015	0.021	
	12	55 0033	0.044	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210510
36 48 21.0 086 04 15.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0042 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	13 50	0000	19.8		54	165	8.00	70	0.050	0.500	0.410	0.002K
	13 50	0004	19.7	6.4J		160	7.70	70	0.070	0.400	0.510	0.002K
	13 50	0010	19.2	6.6		165	7.90	71	0.060	0.400	0.460	0.002K
	13 50	0015	17.4	5.6		165	7.70	69	0.090	0.500	0.560	0.002K
	13 50	0040	16.5	3.8		220	7.50	74	0.150	0.600	0.580	0.004
73/08/13	14 20	0000	28.3		48	188	8.50	77	0.070	0.600	0.050	0.006
	14 20	0005	28.0	8.0		184	8.50	73	0.090	0.500	0.110	0.007
	14 20	0015	26.3	0.4		188	7.70	79	0.110	0.200	0.250	0.006
	14 20	0025	23.7	1.0		219	7.50	97	0.400	0.600	0.280	0.007
73/10/23	13 15	0000	29.5		37	210	8.00	86	0.040	0.300	0.030	0.005
	13 15	0005	29.5	9.0		203	7.80	85	0.040	0.200K	0.040	0.006
	13 15	0015	29.6	7.2		206	7.60	86	0.060	0.200K	0.060	0.007
	13 15	0028	29.6	2.4		700	7.20	133	0.560	0.600	0.490	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	13 50	0000	0.021	3.1
	13 50	0004	0.025	
	13 50	0010	0.023	
	13 50	0015	0.028	
	13 50	0040	0.047	
73/08/13	14 20	0000	0.027	8.4
	14 20	0005	0.028	
	14 20	0015	0.027	
	14 20	0025	0.063	
73/10/23	13 15	0000	0.032	10.0
	13 15	0005	0.026	
	13 15	0015	0.031	
	13 15	0024	0.035	

LESS THAN INDICATED
K VALUE KNOWN TO BE

STORET RETRIEVAL DATE 75/01/27

210511
36 46 02.0 086 02 25.0
BARREN RIVER RESERVOIR
21009 KENTUCKY

11EPALES
3

2111202
0030 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/19	14 30	0000	19.1		36	180	7.80	79	0.030	0.600	0.560	0.002
	14 30	0004	19.0	9.4		180	7.90	82	0.030	0.500	0.580	0.002K
	14 30	0015	18.3	6.2		190	7.60	85	0.070	0.400	0.640	0.002K
	14 30	0028	16.8	6.2		182	7.70	70	0.080	0.400	0.600	0.002K
73/08/13	16 00	0000	30.1		30	199	8.20	79	0.110	0.500	0.130	0.007
	16 00	0005	27.6	6.6		194	8.10	80	0.060	0.400	0.050	0.006
	16 00	0010	26.6	6.6		202	8.10	90	0.150	0.400	0.170	0.007
73/10/23	13 35	0000	29.3	10.0	14	199	8.10	98	0.040	0.300	0.090	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/19	14 30	0000	0.028	10.4
	14 30	0004	0.027	
	14 30	0015	0.020	
	14 30	0028	0.020	
73/08/13	16 00	0000	0.059	8.1
	16 00	0005	0.042	
	16 00	0010	0.047	
73/10/23	13 35	0000	0.058	12.9

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 78/05/31

2105A1 LS2105A1
37 01 30.0 085 59 30.0 4
BEAVER CREEK
21 7.5 GLASGOW N
I/BARREN RIVER RESVR 051691
BRDG ON US 68 4 MI W OF GLASGOW
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	11 30		1.5	0.180	0.042	0.005K	0.025
73/05/01	12 45		1.5	0.100K	0.007	0.010	0.030
73/06/17	09 25		2.0	0.630	0.078	0.017	0.080
73/07/22	08 15		1.4	0.690	0.044	0.030	0.130
73/08/19	08 55		1.4	0.100K	0.020	0.012	0.055
73/09/16	11 10		0.8	2.100	0.072	0.021	0.045
73/10/14	07 30		0.3	2.200	0.294	0.011	0.045
73/11/17	11 45		0.4	0.300	0.016	0.012	0.012
74/01/20	09 05		1.7	0.400	0.040	0.020	0.040
74/01/30	12 25		1.5	0.400	0.035		0.030
74/02/13	08 33		1.4	0.100K	0.005K	0.015	0.015
74/02/28	13 00		1.4	2.200	0.040	0.015	0.030
74/03/29	12 50		1.4	0.400	0.015	0.005	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

210581 LS210581
36 59 00.0 085 56 00.0 4
SOUTH FORK
21 7.5 GLASGOW S
T/BARREN RIVER RESVR 051691
BRDG ON US 31E.1 MI S OF GLASGOW
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	10 15		1.4	0.210	0.020	0.013	0.025K
73/05/01	13 15		1.2	0.200	0.028	0.010	0.025
73/06/17	10 05		1.4	0.210	0.023	0.020	0.040
73/07/22	08 40		1.5	0.500	0.022	0.044	0.090
73/08/19	09 30		0.8	2.310	0.020	0.005K	0.025
73/09/16	11 30		0.3	1.760	0.378	0.015	0.030
73/10/14	09 00		1.0	1.050	0.023		
73/11/17	15 35		0.2	0.400	0.020	0.036	0.045
74/01/13	14 30		1.4	0.100K	0.067	0.010	0.015
74/01/20	09 50		1.7	0.100	0.010	0.025	0.035
74/01/30	13 34		1.7	0.400	0.025	0.020	0.020
74/02/20	14 10		1.3	1.500	0.035	0.010	0.030
74/03/29	13 50		1.3	0.300	0.010	0.020	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

210582
36 58 40.0 085 58 20.0 4
SOUTH FORK
21 7.5 GLASGOW S
T/BARREN RIVER RESVR 051091
BANK 2.5 MI W OF GLASGOW
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	13 15		1.0	4.100	1.790	0.660	1.000
73/05/01	13 30		1.0	3.990	2.000	0.830	1.150
73/06/17	16 00		1.7	4.800	3.000	1.800	1.930
73/07/22	15 45		1.8	2.700	1.200	0.840	0.995
73/08/19	15 30		0.3	7.600	4.300	3.700	4.200
73/09/16	12 00		0.2	11.000	5.700	4.300	4.650
73/10/14	12 30		0.2	6.750	0.087	2.200	2.500
73/11/17	15 15		0.2	9.000	4.300	3.700	4.300
74/01/20	11 05		1.4	1.100	0.300	0.490	0.630
74/01/30	13 47		1.3	4.000	1.050	0.750	0.930
74/02/13	09 45		1.2	2.000	0.760	0.630	0.890
74/02/28	14 25		1.2	3.700	1.150	0.540	0.870
74/03/29	14 00		1.3	3.300	1.570	0.600	0.930

STORET RETRIEVAL DATE 73/05/31

21BSC1 LS21BSC1
36 59 30.0 085 57 00.0 4
HUGGINS BRANCH
21 7.5 GLASGOW S
T/BARREN RIVER RESVR 051691
BRDG ON ST RT 1297 .2 MI W OF GLASGOW
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	10	35	0.8	0.210	0.042	0.005K	0.025
73/05/01	13	00	0.7	0.390	0.099	0.007	0.015
73/06/17	09	00	0.4	0.405	0.054	0.025	0.025
73/07/22	08	30	0.9	0.260	0.037	0.022	0.040
73/08/19	09	10	0.2	1.900	0.044	0.013	0.020
73/09/16	11	25	0.1	3.100	0.170	0.022	0.045
73/10/14	07	50	0.2	0.700	0.086	0.025	0.035
73/11/17	11	25	0.03	0.600	0.020		0.015
74/01/20	09	20	1.1	1.800	0.040	0.020	0.025
74/01/30	12	45	0.9	0.400	0.015	0.015	0.015
74/02/13	08	45	0.9	1.350	0.055	0.010	0.010
74/02/28	13	22	0.8	1.500	0.085	0.015	0.015
74/03/29	13	10	0.7	0.400	0.025	0.010	0.012

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

21050I LS2105D1
36 55 00.0 085 55 00.0 4
SKAGGS CREEK
21 7.5 GLASGOW S
T/BARREN RIVER RESVR 051691
BRDG ON RT 249 1.2 MI S OF BRISTLETOWN
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	12 30		0.8	0.130	0.022	0.005K	0.025K
73/05/01	15 15		0.8	0.100K	0.017	0.005K	0.015
73/06/17	10 30		0.9	0.440	0.034	0.019	0.060
73/07/22	09 05		1.0	0.260	0.052	0.027	0.035
73/08/19	09 50		0.5	1.980	0.023	0.005K	0.030
73/09/16	11 45		0.2	2.200	0.640	0.010	0.045
73/10/14	09 20		0.1		0.032	0.010	0.050
73/11/17	12 20		0.1	0.850	0.016		0.005
74/01/20	10 35		1.3	0.300	0.007	0.012	0.015
74/01/30	13 10		1.1	0.500	0.015	0.010	0.010
74/02/13	09 10		1.1	0.100K	0.020	0.015	0.015
74/02/28	13 45		1.0	2.600	0.150	0.010	0.010
74/03/29	13 35		0.6	1.000	0.090	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

/TYPA/AMBNT/STREAM

210SE1 LS210SE1
36 45 30.0 086 02 00.0 4
GLOVER CREEK
21 7.5 AUSTIN
T/BARREN RIVER RESVR 051691
BRDG ON RD .5 MI SE BROWNS FORD BOAT RAMP
11EPALES
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10 05		0.7	0.420	0.168	0.005K	0.020
73/04/28	17 00		0.5	0.210	0.010	0.005K	0.020
73/06/11	11 30		0.3	0.715	0.078	0.008	0.045
73/07/22	09 00		0.2	0.840	0.050	0.026	0.085
73/08/19	09 00		0.01	0.645	0.039	0.015	0.045
73/09/16	14 30		0.01	0.510	0.042	0.009	0.045
73/10/15	12 35		0.03	0.900	0.042	0.010	0.045
73/11/28	14 35		1.2	0.600	0.016	0.048	
73/12/27	16 15		0.8	1.100	0.016	0.020	0.020
74/01/26	11 25		0.9	0.100K	0.020	0.010	0.020
74/02/23	14 15		0.5	0.600	0.030	0.005	0.030
74/03/31	16 25		0.3	0.200	0.020	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

2105F1 LS2105F1
36 45 30.0 086 02 00.0 4
TRACE CREEK
21 7.5 AUSTIN
T/BARREN RIVER RESVR 051691
BRDG ON RD .25 MI NE BRWN FORD BOAT RAMP
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10 15		0.8	0.255	0.026	0.005K	0.020
73/04/28	17 10		0.5	0.700	0.160	0.005K	0.030
73/06/11	11 45		0.3	0.480	0.069	0.007	0.035
73/07/22	09 00		0.2	0.840	0.029	0.023	0.080
73/08/19	09 05		0.01K	1.680	0.035	0.009	0.035
73/09/16	14 35		0.01K	0.480	0.031	0.008	0.040
73/10/15	17 45		0.05	0.850	0.130	0.013	0.035
73/11/28	14 38		0.9	0.800	0.020	0.044	
73/12/27	16 00		0.8	0.300	0.016	0.016	0.020
74/01/26	11 15		0.9	0.200	0.065	0.015	0.020
74/02/23	14 45		0.9	1.300	0.030	0.010	0.020
74/03/31	16 00		0.9	0.200	0.020	0.005	0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

2105G1 LS2105G1
36 45 30.0 086 02 30.0 4
RHODEN CREEK
21 7.5 AUSTIN
T/BARREN RIVER RESVR 051691
BRDG ON ST RT 98 2 MI ESE OF MAYNARD
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10 30		0.6	0.200	0.018	0.005K	0.015
73/04/28	17 15		0.3	0.380	0.021	0.005K	0.020
73/07/22	09 10		0.2	0.705	0.029	0.023	0.075
73/08/19	09 15		0.01K	1.260	0.044	0.010	0.040
73/09/16	14 40		0.01K	0.880	0.160	0.008	0.037
73/10/15	18 00		0.01K	2.000	0.132	0.012	0.040
73/11/28	15 00		1.3	0.100	0.008	0.012	0.050
73/12/27	16 20		0.8	0.200	0.010	0.012	0.012
74/01/26	11 00		0.8	0.300	0.045	0.010	0.020
74/02/23	14 30		0.7	0.500	0.040	0.010	0.015
74/03/31	15 50		0.5	0.200	0.010	0.005K	0.012

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

2105M1 LS2105M1
36 42 30.0 085 05 00.0 4
LONG CREEK
21 7.5 HOLLAND
T/BARRE RIVER RESVR 052091
BRDG ON ST RT 100 1.2 MI NWOF HOLLAND
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10	50	0.8	0.140	0.005K	0.006	0.015
73/04/28	17	30	0.7	0.150	0.021	0.005K	0.015
73/07/22	09	40	0.6	0.120	0.021	0.016	0.025
73/08/19	09	35	0.4	1.890	0.047	0.011	0.025
73/09/16	15	00	0.4	0.840	0.252	0.008	0.025
73/10/15	17	30	0.2	1.780	0.113	0.011	0.027
73/11/28	13	00	1.2	0.500	0.008	0.024	
73/12/27	16	25	1.2	0.700	0.020	0.012	0.020
74/01/26	10	45	0.9	0.300	0.025	0.010	0.020
	11	10	0.8	0.700	0.025	0.025	0.063
74/02/23	15	00	0.8	1.700	0.060	0.010	0.022
74/03/31	16	30	0.7	0.100	0.020	0.005K	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 78/05/31

2105J1 LS2105J1
36 42 00.0 086 03 00.0 4
BARREN RIVER
21 7.5 HOLLAND
I/BARREN RIVER RESVR 051691
BRDG ON ST HT 100 1.5 MI E OF HOLLAND
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	11 05		0.7	0.210	0.023	0.010	0.030
73/04/28	17 45		0.5	0.290	0.063	0.010	0.030
73/07/22	09 20		0.7	0.800	0.037	0.029	0.070
73/08/19	09 45		0.1	1.050	0.058	0.013	0.050
73/09/16	15 05		0.3	0.620	0.024	0.008	0.045
73/10/15	17 55		0.1	1.600	0.115	0.010	0.045
73/11/28	16 30		0.9	2.200	0.104	0.044	
73/12/27	16 30		1.2	0.200	0.012	0.020	0.032
74/02/23	15 15		0.8	1.600	0.030	0.015	0.040
74/03/31	16 40		0.6	0.300	0.025	0.010	0.030

STORET RETRIEVAL DATE 78/05/31

2105J2
36 53 50.0 086 08 05.0 4
BARREN RIVER
21 7.5 MEADOR
O/BARREN RIVER RESVR 051691
BANK AT GAGING STA BELO BARREN RIVER DAM
11EPALES
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/13	09 00		0.8	0.240	0.023	0.005K	0.025K
73/05/01	14 10		0.8	0.230	0.044	0.007	0.025
73/06/17	13 35		0.6	0.310	0.058	0.005K	0.015
73/07/22	11 05		0.2	0.600	0.220	0.010	0.020
73/08/19	12 25		0.02	1.600	0.067	0.005K	0.020
73/09/16	13 40		0.03	1.260	0.290	0.005K	0.020
73/10/15	15 00		0.04	1.050	0.730	0.009	0.030
73/11/28	10 40		0.3	0.400	0.012	0.005K	0.065
74/01/20	14 45		1.0	0.400	0.105	0.030	0.070
74/01/30	14 18		0.9	0.500	0.040	0.030	0.065
74/02/13	10 10		1.0	0.300	0.035	0.030	0.055
74/02/28	14 50		1.0	0.500	0.035	0.010	0.045
74/03/29	14 45		0.8		0.120	0.010	0.065

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/03

21058A TF21058A P0100704
36 59 00.0 085 57 30.0
GLASGOW
21 7.5 GLASGOW SOUT
T/BARREN LAKE
S FORK BEAVER CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/17	08	00							
CP(T)-			0.130	22.000	4.700	5.650	7.800	2.100	2.400
73/04/18	08	00							
73/05/05	00	00							
CP(T)-			0.375	13.200	1.580	4.300	6.100	3.300	2.800
73/05/08	24	00							
73/06/14	07	30							
CP(T)-			0.270	21.000	4.000	7.000	9.500	2.200	2.780
73/06/15	07	30							
73/06/14	08	30							
CP(T)-			0.110	22.000	1.980	2.600	5.740	2.800	2.500
73/06/15	08	30							
73/09/19	08	00		17.300	3.700	7.600	9.950	1.900	1.830
73/10/02	07	00							
CP(T)-			0.160	34.800	10.500	8.000	11.500	1.800	1.600
73/10/03	07	00							
73/11/05	07	00							
CP(T)-			0.040	31.500	9.000	7.525	12.000	1.600	1.700
73/11/06	07	00							
73/12/04	08	00							
CP(T)-			0.310	24.000	2.400	5.500	8.500	4.000	2.040
73/12/05	08	00							
74/01/21	09	00	1.680	10.000	0.250	2.000	2.400	3.500	4.000
74/02/06	09	00	1.400	7.100	0.560	2.900	3.700	4.200	5.100
74/03/30			1.240	1.000K	0.200	1.300	2.130	6.000	4.000

STORET RETRIEVAL DATE 75/02/03

210521 AS210521 P002207
36 42 25.0 085 41 30.0
TOMPKINSVILLE
21009 250 CUMBIN
T/BARREN RESERVOIR
MILL CREEK / BARREN RIVER
11EPALES 2141204
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/21	00	00							
CP(T)-			6.000	2.400	0.250	9.100	9.200	0.187	
73/06/21	12	00							
73/08/07	07	00							
CP(T)-			0.300	M.100	0.250			0.250	0.205
73/08/07	15	00							
73/09/11	00	00							
CP(T)-			6.400	0.760	0.273	13.900	14.000	0.306	0.275
73/09/11	24	00							
74/02/07	11	00							
CP(T)-			1.120	1.700	0.210	4.900	5.450	0.324	0.258
74/02/07	16	00							
74/03/08	11	00							
CP(T)-			0.240	2.500	0.050	5.750	6.100	0.260	0.230
74/03/08	16	00							
74/04/11	11	00							
CP(T)-			7.400	1.000K	0.130	5.400	5.600	0.300	0.260
74/04/11	16	00							
74/05/13	11	00							
CP(T)-			0.360	1.800	0.050K	8.000	8.700	0.270	0.260
74/05/13	16	00							
74/06/14	11	00							
CP(T)-			1.760	1.000K	0.071	7.350	8.500	0.250	0.260
74/06/14	16	00							
74/07/16	11	00							
CP(T)-			0.640	2.700	0.085	7.400	9.400	0.290	0.280
74/07/16	16	00							
74/08/18	11	00	0.300	1.900	0.050K	9.800	10.500	0.240	0.222
74/09/24	11	00							
CP(T)-			3.780	1.550	0.100	7.200	8.150	0.350	0.280
74/09/24	16	00							
74/10/29	11	00							
CP(T)-			10.400	2.450	0.110	8.850		0.324	0.460
74/10/29	16	00							